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Life-Affirming Carbon Capture

Contribution to GTI Forum The Climate Movement: What's Next?

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What is the Climate Movement's State of Play?

There are immense possibilities for healing the earth and ourselves. These are usually put forth in terms of a consensus that is emerging among climate scientists: in order to avert the most catastrophic impacts of climate change, we will need to remove substantial amounts of carbon dioxide from the air. There is growing interest in "negative emissions"—withdrawing more CO2 out of the atmosphere than we are putting into it. I want to make two points about this. First, there are some very positive ways of doing this, in collaboration with nature and with a great variety of beneficial impacts, and there are also some hi-tech proposals on the table that are highly questionable, to say the least. Second, the choice among these is at this moment being decided in the usual way, by political power, which is mostly (as Bill McKibben notes) the power of money.

The natural methods for removing carbon and other greenhouse gases (GHGs) include restorative agricultural methods, which rely on low- or no-till approaches, organic fertilizers instead of chemical ones, intercropping, a diversity of cultivated plant and animal species, and eventually the discontinuance of chemical pest and weed killers. The results include restoration of soil health, which in turn improves productivity and crop yield—just the opposite of conventional agriculture. Proven results also include substantially more nutritious produce, minus the chemicals on foods which have been shown to create a variety of diseases and unhealthy conditions now widespread among consumers of the products of industrial agriculture. After a transition period of three to ten years, the methods of restorative agriculture lead to an

economically healthier farming sector. Restorative farmers don't need to pay for the expensive commercial inputs used in industrial agriculture, while getting as much or more yield per acre, with the promise of increasing the fertility of their fields over time. In contrast, industrial agriculture is degrading the soil quantity and quality to the extent that the UN's Food and Agriculture Organization has projected that, without dramatic changes, only 70 more harvests are left before we become unable to feed the world's human population.

Restoration of grasslands may be categorized with restorative farming methods, but deserves special mention, as grasslands all together account for a large proportion of non-urban lands in the world—more than either farmland or forests. New methods are emerging for using grazing animals as part of a healthy ecosystem in which annual grasses are replaced with native perennial types, some of which have roots stretching six feet into the soil. The root-imbued soil, with the related microorganisms, are even more important for storing carbon and other GHGs than the portions of the plants seen above ground. Wetlands restoration is another known natural method for removing carbon and other greenhouse gases from the air. Hurricane Katrina, which devastated New Orleans, showed additional compelling reasons for preserving and restoring wetlands, i.e., to hold water during storm surges.

The carbon capture and storage (CCS) benefits of forest restoration have been known for several decades. In contrast, "urban greening" is just beginning to be recognized as one of the most important ways of storing GHGs in urban plants and soils, while providing significant health benefits to the more than half of the world's populations that now live in cities. Ocean protection and restoration is another enormously important issue, with vast amounts of CO2 and other GHGs being released from areas where the oceans have lost critical elements of their biodiversity.

All of the natural methods for CCS have multiple positive side benefits, beyond those mentioned. As just one example, healthy soils in any of the areas mentioned—farms, cities, forests, etc.—filter and purify water. There is a great need for investment in all of these areas. Some, as in the case of farming, will only require bridge funding for a transition period, while new methods take root. Others need to be understood as producing public goods: they produce cleaner water; buffering from storms; a degree of protection against both drought and flooding; cooling of cities—up to 10 degrees or more—as tree canopies and urban greenery are increased; and strongly

positive health effects, including protection against mental illness and improved operation of our immune systems. Ecological restoration in any of these areas, as well as in others, can also provide meaningful, healthy jobs. But jobs normally require funding, and given the public good character of many of the desirable results, much of this will need to be public funding.

"System Change, Not Climate Change"?

As Bill McKibben noted, the public debate over climate is "a fight, not a discourse." The side of the fight representing the climate deniers has been backed by an enormous amount of power and money—from the Koch brothers and the rest of the fossil fuel industry, and from a sizable portion of the Republican Party, now in dominance on the coattails of Donald Trump and his administration. As long as governments are dominated by the power of a corporate system designed to maximize profits without regard for the destructive side effects, we cannot achieve the changes needed to avert disaster.

It is important to know that the chief demand for carbon dioxide captured from the air through technological, rather than natural, methods, comes from oil companies. ExxonMobil, notably, holds the world's largest number of patents in this area. They will use this valuable resource to expand Enhanced Oil Recovery (EOR), a process by which the oil "stranded" in oil fields is forced out of the ground through injections of CO2. Given that sources of affordable, naturally occurring CO2 are being depleted, the oil industry is now looking to "anthropogenic" CO2 for its supply. This process puts more carbon dioxide into the atmosphere than it takes out. Although much of the captured CO2 is injected into the ground and so "sequestered," additional CO2 is released into the atmosphere by the process itself and then by the burning of the fuel extracted via EOR.

Legislative action thus far has relied on the premise that commercial operations and market forces can meet our collective need to reduce atmospheric CO2. Lawmakers have banked on the presumption that the government's role is simply to subsidize private ventures in order to bring down their cost of CO2 removal, making commercial operations for carbon reuse viable. Such logic leads directly back to carbon dependency. It also disregards the known risks of the

technologies being promoted by those who stand to gain from them, and squeezes out funding for natural methods, with their positive side effects.

Political action is needed to terminate subsidies for CCS methods that allow use of captured CO2 for fossil fuel production, to support R&D for innovations that foster soil and biomass carbon sequestration, and to introduce legislation to deploy natural methods of carbon removal that are found to be most effective. This should not only be a fight "against"; we should first rejoice in, and then vigorously promote, the possibility that some of the resiliency, productivity, and beauty that has been lost from our world can be regained, and that doing so can make significant improvements to human health and well-being. While fighting government actions that preserve the worst of the old system, we should be prepared to support government actions that address the need for GHG capture and storage in life-affirming ways.

Experiments with carbon markets are a small step in what might be the right direction—if they are designed to go beyond renewable energy sources and support the most constructive CCS and—importantly—if the negotiations that result in expanded, national-level carbon markets do not result in providing the oil and gas industry with immunity against growing legal efforts to get them to pay for the damages they have knowingly inflicted. These negotiations are already ongoing; the industry is aware that they are on the losing side, and their leaders are showing increasing desperation to strike a deal that will let them off the hook from paying for the needed changes. As noted, real ecological restoration is an enormous job that will require enormous resources, human and financial, over a long period into the future. A critical opportunity will have been missed, and a great injustice permitted, if the fossil fuel companies do not ultimately have to empty their coffers to aid in this effort.

While recognizing the value of staying local in many of our efforts, radical changes will, I believe, need to occur at all levels, from the very local to the global, and they will need to have some way to collect resources from a wide enough community to cover the cost of supplying public goods to all, including those who at present have very few resources. Perhaps "governments" will be so radically reimagined and redesigned in some future that they will go

by some different name, but for the moment when we talk about support of public goods, we need to think of governments as the collective power that can extract resources from the kinds of activities we want to put out of business.

Theoretically perhaps, deep change could occur within the existing system, maybe through the Green New Deal; realistically, it is not likely to—and hence the need for such radical change away from the current capitalist system that it will amount to system change.

Do We Need a Meta-Movement?

As I turn 75, I am making a career move from economics to ecological restoration. I have been working with James Aronson, restoration ecologist at the Missouri Botanical Garden, and others, to create an organization, the EcoHealth Network, which is designed to assist in the necessary work of scaling up and scaling sideways as Robbins calls for in her contribution to this forum. With the goal of fostering rapid increase in the amount and effectiveness of ecological restoration activities throughout the world, the EcoHealth Network is launching an international network to connect existing and future eco-health projects. In fact, thousands of projects of all sizes already exist all over the world where people are doing heroic work to bring ecosystems back to health, but there is little connection among these sites, and far too little public support. Moreover, these efforts have not been sufficiently connected, in people's minds and in practice, with how ecological health affects human health.

I have given a few examples of the kinds of work that need to be done to win the fight for the future of a beautiful Earth that can support healthy people and civilizations. At the level of politics and government, we need to fight back against proposals that would only enrich a few in the short run at the cost of long-run disaster. But the need for a meta-movement goes beyond that. To win the hearts and minds of an effective majority of people requires demonstration that we can all help to address the climate emergency—*we are not helpless*. The most effective approach to lifting our hopes, while addressing the emergency, is work that connects us with ecological restoration.

My personal dream is that by 2030 everyone in the world will either have some direct connection with ecological restoration, or will know someone who has such an involvement. This is ambitious, but consider health clinics: in most parts of the world everyone either has had some contact with a health clinic, or knows someone who has done so. That wasn't always the case. What has been done for curing sickness can be done for making us well.

We all are suffering some form of trauma as we consider the terrible present and worse future effects of climate change. There are doctors now prescribing "a walk in nature" to patients suffering a variety of ailments, including post-traumatic stress disorder and depression. We all need that walk, and we need to connect with organizations—or create them if they don't exist near us—that can make that a "working walk," where we join knowledgeable ecologists in repairing the insults to nature that humans have brought about. In this endeavor, nature will be on our side.

About the Author

Neva Goodwin is Co-director of the Global Development and Environment Institute at Tufts University, where she has worked for more than thirty years to systematize an economic theory appropriate to contemporary real-world concerns. She has edited more than a dozen books, and is the lead author of three introductory textbooks, including Principles of Economics in Context. Recently, her focus has turned to advancing ecological restoration worldwide, launching the EcoHealth Network based at the Missouri Botanical Garden. She holds an MPA from Harvard Kennedy School and a PhD in economics from Boston University.

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